Institutional Support to the Malawi Ministry of Transport

Transport Data Base Report

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USAID/Malawi

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RECOMMENDATIONS

- The MoT should establish a Transport Data Committee
- The MoT should actively participate in the NSO's Economic Statistics workshops
- Make known the importance of having current, accurate, reliable data
- Make greater use of NSO's Customs-based external trade data
- Establish a sustainable set of statistical measures that can be used to monitor transport system performance
- Improve data quality
- Periodically review data for usefulness
- Prioritize data collection
- Publish an annual Malawi transport report
- MoT should play a key role in transport data development
- Make use of NSO's ability to conduct special surveys
- Become proactive in working cooperatively with other data organizations

Transport Data Base Management

1 Introduction

1.1 Data Truisms

It is often said that information is power. That is only partly true. Sound decisions require information. The quality of analysis and decisions is usually no better than the quality of the information used to formulate the decisions.

In the quest to make the most informed decisions there is an insatiable demand for information.

Collection of information is costly in terms of money and time; therefore, there is an inherent relationship between the demand for information and the collection of information (demand and supply).

Unless information is accurate, reliable, consistent and timely it has little value.

A data base includes both textual information and statistical data. Often there is no clear distinction between information and data. In this report the term data will generally be used when referring to both textual and statistical materials.

1.2 What is not included

Although data is frequently processed and manipulated by computers, automation is not discussed in this report beyond noting that the use of computers can improve the accuracy of data collection and provides checks to enhance quality control. The subject of automation is comprehensively addressed in the Computer and Information Systems section of this report.

The focus of this report is on data used for transport policy analysis and planning. Management information which is considered to be financial, accounting and human resource data, while important, is beyond the scope of this report.

1.3 Uses of data

Data is necessary to formulate positions, negotiate change, support decisions, advocate legislation, and monitor performance. Data particularly is essential in analyzing transport conditions and the impacts of different scenarios on those conditions. A very pertinent example is analyzing the impacts of various fuel tax changes on the economy and specifically on the transport sector. Such an analysis would be carried out on the cost side by estimating the amount of fuel consumed by mode, the amount that transport costs would

be increased by the alternative changes in the tax levels, the proportion of the output of the agricultural, manufacturing and construction sectors that is related to transport, and the impacts that these changes would have on consumer prices. On the benefit side the analysts must quantify the savings that would accrue through better roads, reduced transit times, longer vehicle life, reduced maintenance costs, reduced cargo loss and damage, reduced inventories, improved market access, and reduced prices. Policy positions could then be developed to support, oppose, or recommend changes in the fuel tax level. Without appropriate data it is difficult to estimate the impacts of changes in the fuel tax.

Another use of data is in monitoring transport performance to determine if improvements in road maintenance actually result in improved road transport services. This could be accomplished by monitoring such performance measures as transit times, operating costs per kilometer, and rates and fares. Improvements in roads should be reflected in a lowering of these measures over time. Without the ability to monitor performance it is difficult to determine the impact that road improvements have on road transport costs.

1.4 Importance of accurate, reliable, consistent and timely data

For data to be useful it must be accurate, reliable, consistent and timely. There is little that analysts can do with inaccurate, unreliable, and old data. Accuracy is extremely important. This means that the data must be continuously verified and errors must be corrected. Data must also be verified over time to ensure that changes between time periods are reasonable and understood. Abnormalities must be verified and explained. In the case of financial data, adjustments must be made for currency devaluations.

Reliability means that the data can be used with confidence. It reflects what it is supposed to measure. The analyst needs to use data that is consistent. It should be collected in the same manner and measure the same subject over time. The source of the data should remain unchanged. Any changes in the method of collection should be reported and explained.

Timeliness of data is extremely important. The decisions that are based on this data are usually very dynamic. To try and use data which is more than a year old to describe trends is unsatisfactory. An example would be the use of old data to describe trends in international transport. Such data will not reflect any of the recent important changes in mode split, volumes transported, changes in trade patterns and changes in routings that may have occurred. In analysis it is the recent changes in trends that are important. Every effort must be made to ensure that the data used reflects as much as possible what is currently happening in that portion of the transport sector being measured.

2 Data Users in the Ministry of Transport

2.1 Uses

Users' needs will vary depending upon the issues they are studying, the level of detail at which they are examining the issue, and the type of decision which they must make. A decision maker may need only to have the findings of a study. An analyst studying policy alternatives will need quantitative data. Monitoring performance may require periodic

evaluation of a limited number of regularly reported key transport indicators (discussed under Data Sources).

The Minister, Principal Secretary, Senior Deputy Secretary, Director of Planning, Director of Civil Aviation, Director of Marine Transport and Director of Road Traffic and their staffs all have a need for data to support positions and decisions.

The Director of Planning, Director of Civil Aviation, Director of Marine Services and the Director of Road Traffic need to know what is in the data base so that they can plan the analyses needed to support their functional responsibilities. They must determine what kinds of data enhancements are required to enable them to more effectively carry out their responsibilities. They must push to ensure that enhancements, especially improved data quality, are accomplished.

The Ministry uses both general economic and transport specific data; general economic to describe forces which influence transport demand, and transport specific to describe the system and how well it is performing.

The extent of usage depends on the focus of the department. The TPU could use general economic data to forecast demands by tracking those sectors which require transport, including agriculture output, industrial production, and construction. They could use this information to examine impacts of alternative policies such as changes in the fuel tax to meet road construction and maintenance requirements. They could use transport specific data to measure system performance and to determine if competitive forces are resulting in modal shifts of traffic and the lowering of costs and rates. Civil Aviation, Marine and Road Traffic Departments would use the transport specific data to gauge the management effectiveness of their programs.

A review of Malawi's transport and economic sources reveals that there is substantial data already available. There is very little new data that needs to be collected. What new data is needed could be collected through small surveys. In collecting data the uses should be clearly defined, and the collection methods kept simple and sustainable. Malawi should concentrate on improving the quality of this data rather than collecting new data.

2.2 Policy analysis and system performance monitoring

Policy analysis requires both general economic and transport specific financial data permitting the examination of costs and benefits of alternative transport system changes. Examples would be an analysis of the impacts on the economy of alternative levels of fuel taxes to finance road construction and maintenance programs or the impacts on the economy, government and the transport sector of continuing privatization of the transport parastatals.

System performance will require regular monitoring of measures such as tons, ton kilometers passengers, passenger kilometers, transit times, load factors, costs, loss and damage, and accident and injuries, by modal specialists within the TPU. Data for freight and passengers is available today for rail, water and air. Accident data is available from

the police, and Marine and Civil Aviation Departments. Passenger data is available for only a small part of the intercity bus industry. Data on transit times, load factors, costs and loss and damage could be developed through small modal surveys.

3 The state of transport data and information today

3.1 Availability

There is considerable transport and general economic data and information available from a variety of Government of Malawi sources including National Statistical Office (NSO), MoT, National Economic Council (NEC), and the Reserve Bank of Malawi, the transport parastatals Lake Service, Air Malawi, Shire Bus Lines (formerly Stagecoach Malawi Ltd.), and from the soon-to-be- concessioned Malawi Railways. NSO has recently completed a survey of mini bus operations which when published should provide some information on this segment of the road passenger industry. At present there is no data readily available on domestic road freight, intercity and urban mini bus and taxis.

3.2 Accuracy and reliability

The accuracy and reliability of data is a real concern. Both the general economic and the transport data suffer from unexplained year to year or intermittent variations. Data published by both NSO and NEC for rail, lake, and air passengers and freight are not the same for the same years (Table 1). The differences in vehicle registrations will at times vary by a magnitude of two for the same years (Table 1). Data on exports and trade balances will differ between NSO, NEC, and the Malawi Reserve Bank (Table 1). The differences often involve years for which the data should not have been considered preliminary. Such differences cast considerable doubt on the accuracy and reliability of what is being reported. These problems suggest a lack of quality control which must be addressed before any of the data can be used with a degree of confidence.

3.3 Timeliness and consistency

Timeliness and consistency are very real problems with the transport data. Some modes like Malawi Railways and the Lake Service publish the same operating and financial information annually and it is current to the most recent full year (1998). Information gathered by Civil Aviation, although consistent in what is reported, is at least two years old. Information gathered by Road Traffic can be either current or very old and its consistency as well as reliability is uncertain.

3.4 Strengths and Weaknesses

The general economic data is current although the unexplained differences between identical modal and economic data reported by the NSO, NEC, and Malawi Reserve Bank raise questions about data accuracy, reliability and consistency (Table 1). With improvements in quality control, the economic data would be more effective for planning and policy analysis.

Data for the Malawi Railways and Lake Service is accurate, reliable, consistent and timely and can be used for planning, policy analysis and performance monitoring. Air Malawi publishes very little operating data although what is in their annual report is current. Data collected by the Civil Aviation office which could supplement Air Malawi and provide more information on passengers, cargo, mail, and flights for all international and domestic traffic, is two years old.

The accuracy and reliability of the Road Traffic registrations data is questionable. The data represents the number of vehicles registered. There is at present no readily available way to determine how many of those vehicles are still operating. The problem could be somewhat overcome by using the annual road tax payments to estimate the number of vehicles that are actually registered and operating, the assumption being that the tax would only be paid on an operating vehicle. Also since the road tax varies by vehicle type it would be possible to estimate total numbers of vehicles in each tax category.

The International Traffic Statistics (1995) published by the MoT Planning Office, which covers truck and rail, is not current although the data is accurate and reliable. The information on domestic intercity passengers is available for only about 30% of the traffic. There is essentially no information available for either domestic intercity truck or urban bus and taxi.

The general economic data is important to NEC, the Reserve Bank, Ministry of Finance (MoF) and donors. Its timeliness reflects this importance but it still has quality control issues that raise questions about its accuracy, reliability and consistency (Table 1). The Customs import, export and transit information is extremely important to MoF, Ministry of Commerce and Industry and its timeliness reflects this importance. Preliminary review indicates that the Customs foreign trade data is accurate, reliable and consistent.

The data issue is really one of quality. There appears to be sufficient data available to support most policy analysis and some performance monitoring. Additional data required could be collected through small surveys. The focus of all data users should be to improve the quality of the data which is now being collected.

Users must prioritize data collection efforts. They must identify what data is useful to them so that scarce resources are not spent collecting data that has little or no value. The collection of data must be predicated upon needs. An analyst must decide what data will best answer the question and then decide if that or similar data is already available. Often a search will reveal that the source or similar source already exists. If data needs to be collected then it should be accomplished in a simple, cost efficient and sustainable manner.

4 Data Costs

There are significant costs associated with data collection and processing. In fiscal year 1999, NSO budgeted over one million kwacha for the collection, processing and publishing of transport data. In addition they received almost 577,000 kwacha to conduct a survey of minibus operations. This does not include any of the costs associated with the Customs data which is handled by NSO's Foreign Trade and National Accounts Section. MoT, on the other hand, has no specific budget for collecting and processing data. These functions are all handled as collateral responsibilities by the TPU, and the Road Traffic, Marine and Civil Aviation Departments' staffs. This is the case even though the TPU identifies data collection as one of its primary responsibilities. The MoT's principal interest in data collection, at least within the Departments, is for management and budget purposes. This information helps in tracking work load, planning for staff changes and developing budgets. Neither the MoT nor the Departments actually publish any of this data. Some information such as vehicle registrations from Road Traffic and air passenger volumes through airports from Civil Aviation is provided to NSO for publishing but it is not always current. The TPU reports international truck and rail traffic on an annual basis but is overburdened by the work load. The most recent data published is for calendar year 1995.

Collecting data requires the establishment of channels to ensure that the information is regularly submitted in a consistent manner to a central point for processing. There must be a substantial quality control process implemented to verify the data, both before it is taken from the source documents and then after it is processed, to ensure accuracy, reliability and consistency. A review of both the Malawi economic and transport data indicates that much more effort must be put into improving data quality. Data collection, verification and reporting is a costly and time intensive process which can place a heavy burden on the financial and staff resources of an organization. Clearly, undertaking a significant data collection effort is not an effective use of the TPU staff.

There is another very significant cost involved in data collection and that is the burden placed upon the source which could be either another government agency or, in a deregulated transport environment, the private sector. What may seem like a simple request for data will require person-hours to extract it from existing records, collect it if it is not readily available, structure it in the manner requested and submit it. This is frequently a cost with no benefit to the provider. In view of this burden it is important that the data users keep requests for new data to an absolute minimum. A search of available sources will frequently reveal either the needed data or surrogate data which will provide similar results. An example of surrogate data would be the use of the annual road tax payments to estimate the number of commercial trucks, buses, minibuses and taxis being operated by region.

5 Data sources (sources are listed in the appendix)

5.1 General economic data

Economic indicators such as GDP by sector, income and expenditures and trends in inflation rates are published semi-annually and annually by the NEC in the Economic Report. Indicators concerning agricultural production, industrial production, building and construction and government finance are reported monthly, current to October 1998, by the

NSO. If the TPU required more detailed data it should be available from either NSO or the source ministries. NSO reports employment and earning information but it is not current (1994-1995).

5.2 National Accounts

National accounts information is available annually from the Economic and Financial Review published by the Malawi Reserve Bank, semi-annually and annually from the Economic Report published by NEC and is available annually by size of firm from the NSO. The NSO information which covers the period 1994-1998 can be provided on diskette.

5.3 Agricultural and Industrial output

Economic indicators for agricultural output, industrial production and building and construction are reported both by both NEC and NSO, current to September/October 1998. NSO can provide this information on diskette.

5.4 Population

A total population estimate is available from the NEC for 1998. Detailed population data, based on the 1987 Population and Housing Census, is available from the NSO. It should be contacted to determine if there is a later population census available.

5.5 External Trade

Information on imports, exports, and re-exports by major product groups, and by quantity and value are reported in the NSO Monthly Statistical Bulletin. The information is actual through 1995 and provisional through August 1998. Some of this information can be provided on diskette. Malawi Customs documents, which are the source for this information, include in-transit traffic as well as mode of transport (air, rail, truck). There is no waterborne international traffic that is not handled by the other modes.

5.6 Transport Specific

5.6.1 Vehicles, vessels, aircraft, rolling stock

Data on vessels, aircraft, and rolling stock are available and are current for 1998. Information on motor vehicle registrations is current through June 1998 but reflects only those registered, not those that were registered prior to that period and are still being operated.

5.6.2 Kilometers of roads, track, airports, ports

The inventory of roads is not current (1996); information on kilometers of track is available from the Malawi Railways; number of airports is current to 1998 as is the information on lake ports.

5.6.3 Data can be used to formulate performance measures

Performance measures provide an indication of how the transport system is functioning over time. These measures include tons and passengers transported, ton kilometers, passenger kilometers, load factors, transit times, accidents, cargo losses, and operating costs.

5.6.4 Suggested data that can be used to create performance measures

- Tons, Ton Kilometers - for road, rail, water and air transport
- Passengers, Passenger Kilometers - for road, rail, water, and air transport
- Transit and travel times - for road, rail, water, and air freight and passenger transport
- Accidents, injuries - for road, rail, water, and air transport. This information should be stratified by type of accident, cause and what was involved (including car and a truck, pedestrian, two vessels, grade crossings)
- Load factors - road, rail, water and air freight and passenger
- Costs per kilometer - road, rail, water, and air freight and passenger
- Rates and Fares - road, rail, water, and air freight and passenger
- Loss and Damage - road, rail, water, and air freight and passenger
- Average value per ton - road, rail, water, and air freight
- Energy consumption by mode - road, rail, water, and air freight and passenger

  - Tons, passengers, ton kilometers and passenger kilometers is available for rail and lake for 1998. Passengers and tonnage information is available for air from the Civil Aviation Department through 1997 and from Air Malawi for 1998. Air passenger kilometers and ton kilometers for Air Malawi are available from the International Air Transport Association through 1996 and probably from Air Malawi as unpublished data for 1998. Domestic bus passengers and passenger miles are available from Shire Bus Lines for their operation.

  - There is no such data for domestic trucking, urban bus and taxi and most of the intercity bus traffic. Tons transported by truck and rail internationally is available through 1995 from the MoT published International Traffic Statistics.

  - Information on accidents, deaths and injuries by type of vehicle is reported through 1997. MoT receives the source data on accidents from the police but they do not use it. Other performance measures such as load factors, transit times, cargo loss and damage, rates and fares, average value

per ton, energy consumption by mode and operating costs are not readily available and would have to be developed from the carriers or other sources.

These are all data that can be used to monitor the performance of the various freight and passenger modes of transport. It is not necessary to have all these measures for each mode. The measures represent objectives to work towards, not an immediate requirement. Some of the measures will be more easily developed than others. The importance of using such measures is the changes that occur over time. Increases in the average value per ton by rail and a decrease by truck could indicate that the rails are capturing some of the traffic that was handled by truck. Increases in load factors could mean better utilization of equipment. Changes need to be examined and explained.

These measures are not magic; there may be others which are more readily available that can be just as useful such as numbers of new heavy truck and bus registrations or increases in heavy vehicle drivers licenses. Significant increases in registrations or licenses could indicate an expansion in these transport industries. Measures such as tons, ton kilometers, passengers, passenger kilometers, load factors and average value per ton reflect performance. Costs per ton and rates and fares reflect economic vitality. The loss and damage measures reflect security and the accidents reflect safety.

These measures are useful to the TPU in understanding what is happening in the transport sector. Trends in performance measures can aid in alerting MoT to potential problems, are useful in planning programs such as truck safety which could be supported by increases in fatal accidents involving heavy trucks, and monitoring the effectiveness of competition between modes, as demonstrated by reduced costs per kilometer, lower rates, increasing market share tons and ton kilometers.

6 Data Use in Policy Analysis

6.1 The report so far has discussed the need for data, identified sources of data and discussed the need for data improvements. This section illustrates the use of data in two typical case study examples of policy analysis. These were selected as potential current issues that the TPU could be asked to analyze and provide policy positions. The proposed approach in each case is presented to illustrate the kinds of data that would be used to undertake such studies. The examples are not intended to present either a detailed outline of an approach or a detailed listing of all data required to undertake the study. The two examples include an infrastructure investment study, and a toll road revenue study.

6.1.1 Transport Infrastructure Investment - Economic Feasibility Analysis of Developing the Mtwara Corridor

The Malawi Government is currently considering developing, jointly with the Tanzania Government, a new transport corridor and ocean port at Mtwara. The TPU could be requested to analyze the economic feasibility of this project. To do this they would need to develop data on areas including: international trade, transport costs, transit times, traffic diversions and costs of infrastructure construction and rehabilitation in order to examine the costs and benefits of providing another alternative to the existing ports of Nacala, Biera, Durban and Dar es Salaam.

The analysis must first determine the amount of international traffic, by mode, type of commodity and volume currently moving. This data is available from **MoT's unpublished International Traffic Statistics** and from **NSO's External Trade Statistics**. Data must be developed on transport costs per ton kilometer by major commodities and the transit times of shipments to existing ports. This data is available from **Malawi Railways, and Malawi Road Transport Operators Association.** The study must now make some assumptions as to the cost per ton kilometer and transit time of traffic moving over the proposed Mtwara Corridor as well as percent of traffic that is likely to be diverted from existing ports to Mtwara. The **Malawi Road Transport Operators Association** could assist the TPU in developing cost per ton kilometer and estimates of transit time. Traffic diverted from Nacala would represent a loss to the **Malawi Railways** and could be estimated from their international traffic data as well as the **MoT's International Traffic Statistics.** Finally, the analysis would have to consider the cost per kilometer of construction and rehabilitation of roads and other infrastructure needed to develop the Mtwara Corridor. The **National Road Authority** (NRA) or the **Ministry of Works** (MoW) could provide these cost estimates.

6.1.2 Potential Toll Road Revenue Study - Toll Road Feasibility Analysis

The idea of establishing toll roads on some of the high traffic volume corridors in Malawi has been periodically discussed. The tolls or user fees would be used to cover the costs of maintaining these roads. The heaviest used intercity road is the M1 between Lilongwe and Blantyre. The TPU could be requested to conduct a preliminary economic feasibility study of such a project as a means of determining whether further detailed engineering studies are warranted.

In undertaking such a study it would be necessary to develop traffic survey data on the volume of traffic, by vehicle type, over major M1 road segments and to estimate traffic growth patterns over the estimated life of the road. The **NRA** and **MoW** would have some traffic survey data and could advise on developing traffic growth estimates. Some traffic surveys may have to be undertaken to provide current estimates by segments. Estimates will have to be made on the cost of rehabilitating the road to bring it up to the useful life standard. This data could be developed from **NRA** and **MoW**. The study should examine alternative operations including

limited access, open access, tolls charged only to through traffic, and to all traffic. The TPU would develop this information from an analysis of traffic patterns and growth estimates. Alternatives would have to be developed on the level of tolls required by vehicle type to recover the cost of the regular rehabilitation and maintenance of the road. The **NRA** and **MoW** could provide data on the allocation of road wear costs by type of vehicle. Alternatives would also have to be analyzed on methods of financing the project including Build, Operate and Transfer options. Some of the financing data could be collected from the **Reserve Bank of Malawi**.

7 Data Role

7.1 Ministry of Transport - Oversight of transport data collection

The MoT should have a key oversight role in ensuring that Malawi's data meets its needs. They should work closely with the NSO. The NSO, with the Malawi Chamber of Commerce, co-chairs a committee to improve the quality and type of economic data which is collected and reported. The MoT should become an active participant in these workshops. It will benefit directly from any effort to improve and expand general economic data. The establishment of this workshop is an indication of NSO's interest in meeting the users' needs. The MoT should be proactive, seizing upon this opportunity to improve transport data. MoT must determine what information is needed by sector and then coordinate with NSO to see that it is collected and published.

The MoT should establish a Transport Data Committee that would include government and private sector participants. It would be chaired by the Director of the TPU and co-chaired by a senior TPU staff member. The objective of the committee would be to identify and resolve data issues and work to improve the quality of transport data generally. This group could review the data which is now being collected and advise NSO on changes which could improve its usefulness including quality, new data, reporting frequency and format and expanding the amount of data captured from source documents but not reported, for more detailed and specialized analyses. The Committee could also work with NSO to improve technical advice and support to encourage greater use of the transport data collected. The Transport Data Committee should provide input to the NSO Economic Statistics workshops. The Data Committee should meet regularly at the staff level to work on issues and at least twice a year at the office director level to review progress and agree on future directions. Participants should include, but not be limited to NSO, NEC, MoF, Malawi Reserve Bank, MoT Departments; transport parastatals such as the Lake Service, Air Malawi, Shire Bus Lines, and the Malawi Railway; carrier associations such as the Malawi Road Operators Transport Association, shippers associations such as those representing tobacco, maize, tea, coffee, sugar and others.

The MoT should compile and issue special reports and studies on aspects of the transport system that are of interest and not available elsewhere. They should include regular reporting of performance measures by mode and what those measures indicate, publishing an annual report of transport activities and accomplishments and undertaking special modal foreign trade studies.

7.2 Transport Planning Unit (TPU)

7.2.1 Monitoring transport system performance

The TPU has responsibility for monitoring transport system performance. In order to do this effectively they must develop basic transport indicators that are available on a current basis and can be sustained. This can be accomplished on a modal basis by the appropriate transport planning officers. They need to identify the indices best suited for their modes and the sources of data to provide these measures. These officers should be tasked with the responsibility of periodically reporting to the Director on how well the mode is performing. Significant changes in performance either positive or negative should be highlighted and explained. Such information could be published annually in a report on the state of transport in Malawi.

7.2.2 Developing positions

Data plays a key role in the development of policy positions. Policy positions can be initiated by the TPU in response to a developing problem in the system or be requested by the Minister or Principal Secretary in response to political or legislative initiatives from outside MoT.

7.2.3 Identifying transport system problems

Appropriate data will aid in identifying transport problems such as increases in transit times, increases in loss and damage, and increases in accidents. Such information will enable the analyst to alert the Director to the problem and to develop a range of possible actions. Actions in a deregulated environment could include a study to identify causes, establishing committees of government and private sector stakeholders to identify solutions, and holding workshops to increase awareness.

7.2.4 Transport planning

Transport planning requires timely, reliable information to describe what is happening to the system and what can be done to improve it. In a deregulated environment, planning involves extensive interaction between government and private sector stakeholders to work towards common goals. The guide may be the National Transport Policy (NTP) statement, with the TPU acting as the coordinator, facilitating action among stakeholders towards common objectives. Appropriate use of transport data highlights the objectives and aids in maintaining the stakeholders' focus. Examples of such efforts could be increasing safety among transport operators or the reduction of air and noise pollution by the transport sector.

7.2.5 Policy development, analysis and support

Policy development and analysis require data. Data may be required to identify and describe an issue, to examine possible alternative solutions and to support the recommended position. An example of such an issue involves permitting international truckers to participate in domestic transport. The TPU could undertake a cost benefit analysis of such an initiative. The study would require the use of general economic indices as well as transport specific operational and financial data to evaluate the impacts of such a program.

7.2.6 Evaluate transport sector initiatives

The TPU will be called upon to evaluate initiatives proposed by the transport sector. Such proposals could include efforts to restrict competition, reduce safety and environmental restrictions, and increase development of highways, waterways and airports. The TPU will have to study the costs and benefits of such proposals to determine the impacts. The analyses will assist the TPU in developing a Ministry position on the issue.

7.2.7 Coordinate with other Malawi Government organizations

The TPU must coordinate with other government organizations. It may have to rely on them for the data that it needs but can't supply. It may be called upon to provide positions on programs of other Malawi Government organizations that impact upon the transport system.

7.2.8 Collect specific data that is not otherwise available (transport costs, domestic freight and passenger, and other such information)

The TPU will periodically have to collect data that is necessary for carrying out its responsibilities but is not otherwise available. Information on domestic intercity trucking and intercity bus operations are examples. Transportation costs and rates data should also be collected in order to measure performance. This must be accomplished in a cost-effective manner, primarily through small surveys.

7.2.9 Advising officials on transport performance and activities

Officials should be kept regularly advised on the performance of the transport system. This requires current, reliable performance measures that officials both understand and in which they have a high degree of confidence.

7.2.10 Legislative initiatives and support

Data is required both in describing the need for legislation and in supporting the proposal. An example is the assumption that more stringent motor vehicle safety standards are required to reduce accidents. Such a proposal could be made much stronger if accident information was presented to support the assertion.

7.3 Other Government Organizations

7.3.1 Reporting

Other Government organizations use transport statistics in a variety of ways to carry out their own responsibilities. The NEC'S Economic Report contains a section on transport and communications. In this section they discuss trends in transport as indicated by the data. Since this report is published to show the state of the economy as judged by the activity in key sectors, it is very important that the data used as indicators are accurate, reliable, consistent and current. MoT has a responsibility to ensure that whoever is collecting this data meets these criteria.

7.3.2 Planning and policy analysis

Agencies such as Agriculture, Commerce and Industry, Local Governments and others all have to consider transport when conducting their own planning and policy initiatives. Agriculture has to consider the adequacy of transport when forecasting crop yields and marketing, Commerce and Industry when encouraging industrial development or expanding international markets, and Local Governments when considering growth of cities, and reducing congestion. Some of this planning and policy analysis should be carried out in cooperation with MoT.

7.3.3 Legislative initiatives

Transport data and information will be used by other agencies in developing and supporting legislation. Use of appropriate data in formulating legislation should be encouraged. In order for the data to be useful in this process it must accurately reflect what it is measuring. Faulty data could lead to poorly based legislation.

7.3.4 Coordination with Ministry of Transport

Cooperation and coordination between government organizations in dealing with issues that involve other sectors should be encouraged. Policies and plans worked out jointly will have a higher degree of success. Having good data will enhance the contribution that each agency can make towards the solution.

7.4 Private Sector Transport

7.4.1 Measuring performance

The transport sector needs quality data to gauge its effectiveness. Each carrier will know about its operation and something about its competitors but they may not know how they compare with industry or regional standards. Knowing this can help them identify areas of their operation that can be improved. Transport performance measures can provide this standard.

7.4.2 Planning

Transport industries all must regularly analyze their operations to see how they can

be improved. To do this they need data, much of which they will generate internally. For other data they will have to rely on alternative sources such as the government.

7.4.3 Expanding markets

The availability of appropriate high quality data can be very useful as carriers look to expand markets. Such expansion could be within modes, between modes, into other sectors of the domestic economy or internationally. They will use data from many sources to aid in making such decisions.

7.4.4 Legislative initiatives

The transport sector can initiate legislation on its own or it can be a powerful force in supporting legislation proposed by MoT. It may also be important to MoT to be able to oppose legislation proposed by the transport sector if it is inconsistent with public policy.

7.4.5 Coordinating with the Ministry of Transport

MoT should encourage cooperation with the transport sector. The development of a good data base can be useful in carrying out such cooperation. MoT and industry both have need for good performance measures and other transport specific information. A Transport Data Committee consisting of government and industry representatives could be a useful forum for developing and improving the transport data base.

7.5 Improving efficiency in transport data collection

7.5.1 MoT should not establish a separate and duplicate data gathering and reporting effort

Although the TPU has a responsibility for compiling and maintaining transport statistics this does not mean that it is to be carried out either in isolation or in competition with other government agencies. The TPU could more effectively use its capable but limited resources to improve the quality of the data being routinely collected by other agencies. The TPU should work closely with NSO, which has a data collection budget and responsibilities, to improve the quality of the transport data which it is collecting. The MoT should actively participate in the NSO co-chaired Economic Statistics workshops established to improve data quality. The NSO should be encouraged to provide more modal specific data from the important Customs information. The TPU should work closely with NSO to ensure that when transport-related surveys are undertaken the data needed by the Ministry is collected.

TPU should concentrate on collecting such data as transport costs, transit times, loss and damage, and other such measures for gauging the performance of the

transport system. The TPU should begin to analyze and report on the accident data. Other data could be collected through surveys conducted by the present staff and within present budget.

7.5.2 Make greater use of NSO's data base

NSO may be able to provide more detail from its data base than it publishes. It could provide advice and assistance to the TPU in extracting the specific data required. NSO can provide the data on diskette which would be very useful to the TPU in extracting just what it wants and in the form it prefers.

The NSO Director of Transport Statistics and the Director of Foreign Trade and National Accounts indicated an interest in working with the TPU. Discussion with both NSO and the TPU indicated that there had been little if any contact between the two organizations. Neither the NSO or the TPU have any awareness of the other's interest in transport data. Participation in NSO's Economic Statistics workshops would help to remedy this problem.

7.5.3 Make use of its ability to conduct special surveys

The TPU should make use of NSO's ability to conduct special transport surveys such as the one just completed on minibus operations. It is astounding that such a study could have taken place without the MoT being involved. This was a perfect opportunity to develop information on minibus operations, which accounts for approximately 70% of the intercity bus passenger traffic and probably close to 90% of the urban bus traffic. Lack of information on minibus operations is one of the gaps in the transport data base.

NSO indicated that it is now planning to conduct a survey of international traffic handled by Malawian truckers. In discussions, the NSO's Director of Transport Statistics indicated that he would like to work with the MoT in planning the questionnaire. He also indicated an interest in expanding the survey to develop information on domestic truck transport which is at present restricted to Malawian truck companies. If this survey is funded it would provide an opportunity for the TPU to develop data to fill a significant gap in the transport data base.

The TPU should make the NSO aware of any special data needs. If the NSO is unable or unwilling to meet these needs, then the TPU could investigate other methods for collecting this data.

8 Filling data gaps

8.1. Domestic trucking

There is no published data concerning domestic truck transport in Malawi. Developing some information on this section should be a priority for the TPU. This data is essential for analyzing impacts in such areas as changes in fuel tax levels or in removing the cabotage restrictions permitting foreign motor carriers to engage in domestic commerce. There are two transport planning officers assigned responsibility for road transport. These officers should have, as one of their tasks, the responsibility of developing information on the domestic truck sector. A first step should be to explore sources such as the Malawi Road Operators Transport Association, major agricultural associations (tobacco, maize, coffee, tea and sugar) and ADMARC to determine the extent they use domestic trucking in transporting their products. Information could also be developed through such organizations as those representing manufacturing, construction and petroleum products. This could be carried out easily by the TPU staff, and facilitated by the previously recommended MoT Transport Data Committee.

If more data is required on actual operations, the TPU could explore working with the police to gather origin/destination and commodity information at established check points. The Road Traffic Department may be able to assist in such a survey when it conducts road checks. NSO is proposing a survey of Malawi transporters' participation in international trucking which could be expanded to include questions on domestic trucking. Finally, they could contact individual road carriers and request information on domestic traffic as they have done in the past. All of these actions could be carried out by the existing TPU staff, with possible assistance from the Police and the Road Traffic Department, at little or no cost.

8.2 Domestic bus

The TPU presently receives domestic intercity bus operations data covering only an estimated 30% of the traffic that is handled by Shire Bus Lines. The remaining 70% is handled by minibus operations for which there is no published data. NSO has just completed a survey of minibus operations. The TPU should begin immediately to coordinate with NSO to ensure access to the minibus data and prepare a report discussing the findings of the survey. The MoT must become proactive in working cooperatively with other organizations that are developing general economic and transport information.

Beyond this the TPU can develop some information on their own from the minibus association, from minibus operators at terminal locations and at check points in cooperation with the Police and the Road Traffic Department. Some information could be collected by the Road Traffic Department when the minibus operators apply for their annual Certificate of Fitness. These are a few of the low cost methods that could be employed to develop a data profile on this segment of the passenger transport industry.

8.3 Urban bus and taxi

The TPU could explore the use of registration and licensing information to develop more data on this segment of the transport system. It may be able to get some data from the respective associations. Some may be gleaned from the NSO minibus survey.

9 Training

There is no specialized training with respect to developing and maintaining a data base as envisioned above. What is important is to determine what transport issues need to be addressed and then identify what data is needed to answer such issues.

Where training would be useful is in data analysis techniques. In this area, training in simple policy analysis and statistical techniques would be useful for the TPU staff. Some of this may be available through the Internet. Some information may be available through the NEC. There are probably short courses offered through some of the universities and other training centers in the region. There may also be programs offered by the World Bank, European Union or other donor agencies that the TPU could utilize. Any such training would be short term and primarily directed at upgrading skills of the TPU professional staff. Software and hardware training is not discussed here since it has been adequately addressed in the Computer and Information Systems section of the project report.

10 Conclusions

10.1 Appropriate quality data is essential to analyzing impacts and changes in the transport system

10.2 The Ministry is not making full use of the data sources that are available.

10.3 A number of organizations and agencies are collecting data that are important and useful to the transport sector.

10.4 The NSO is the principal agency responsible for data collection in Malawi. Other major organizations include NEC, Reserve Bank of Malawi, MoF, Malawi Railways, Lake Service, Air Malawi, Shire Bus Lines, ADMARC and the MoT.

10.5 The Ministry should work with the data resource agencies and organizations, not compete with them in the data collection areas.

10.6 The MoT should restrict its data collection efforts to a few sub-sector areas where it has a special advantage such as aviation, maritime, and vehicle licensing and registrations, accidents and safety. It can conduct small surveys to collect sample data that is not otherwise available such as transit times, rates and fares, load factors and other such performance measures. It has neither the funds or personnel to engage in significant data collection efforts.

10.7 The MoT should concentrate on helping the data collection agencies improve the quality of data collected.

10.8 The Ministry should actively encourage cooperation with other government organizations and the private sector in the development and exchange of transport data.

11 Recommendations

11.1 The MoT should establish a Transport Data Committee

The TPU should establish a Transport Data Committee that would include government and private sector participants. The objective of the committee would be to identify and resolve data issues and work to improve the quality of transport data generally. The MoT Committee would work closely with the NSO and their Economic Statistics workshops to improve the quality of data.

11.2 The MoT should actively participate in the NSO's Economic Statistics workshops

The NSO, with the Malawi Chamber of Commerce, co-chairs a committee to improve the quality and type of economic data which is collected and reported. The MoT should become an active participant in these workshops. It will benefit directly from any effort to improve and expand general economic data. The establishment of this workshop is an indication of NSO's interest in meeting the users' needs. The MoT should be proactive, seizing upon this opportunity to improve transport data. The TPU can use the MoT Transport Data Committee to provide input into the NSO workshops.

11.3 Make known the importance of having current, accurate, reliable data

MoT should work with NSO and encourage them to improve the accuracy, reliability, consistency, and timeliness of the transport data that is collected and reported. The TPU must determine which of the data presently reported by NSO is useful. It should then work with NSO to have the useful information collected and reported on a current basis. NSO has the capability to collect and report on a current basis data for which there is a demand.

11.4 Make greater use of NSO's Customs-based external trade data

The TPU should explore the feasibility of having transport specific details reported for the external trade data. NSO receives this information from Customs. It is part of the information contained on the Customs documents which is sent directly to NSO twice a month. The documents identify mode, carrier name and nationality. If this information is captured by NSO in the basic external trade data base, then it would be possible to have current, accurate, consistent trade data for truck, rail, and air. If it is not now captured, TPU may be able to get NSO to extract it from the source document and add it to the data record.

11.5 Establish a sustainable set of statistical measures that can be used to monitor transport system performance

Performance measures provide an indication of how the transport system is functioning over time. These measures include tons and passengers transported, ton kilometers, passenger kilometers, load factors, transit times, accidents, cargo losses, and operating costs.

11.6 Improve data quality

Develop checks and balances to improve data quality. There must be a process established by any group responsible for data collection to verify quality. Quality controls must be exercised at every step of the process. Data should be verified on the source document, when it is transferred from the source to the data record, when it is processed, when it is reported and when the final tabulations are ready to be published. Some of the verification will be done manually. Computer software controls can be developed to note abnormalities and require verification before proceeding, once the information is placed on the data record. Any unusual changes in trends must be explained.

11.7 Periodically review data for usefulness

Undertake a regular periodic review of each data source and its uses. The question needs to be asked is this data still useful. Does it still need to be collected? As noted earlier some of the transport data seems to be collected more out of habit than to meet a clearly articulated need. There is a cost associated with collecting data. To collect data that is no longer useful is a waste of resources.

11.8 Prioritize data collection

Prioritize data collection to conserve scarce resources. Only the data that is essential to carrying out policy and planning responsibilities should be collected. Collecting data has a cost which is placed on both the collector and the source.

11.9 Publish an annual Malawi transport report

The TPU should prepare annually a report on the MoT accomplishments and a profile of the transport system. This could be patterned after the NEC Economic Report or the Reserve Bank of Malawi's Financial and Economic Review. The report should discuss accomplishments such as the status of implementation of the National Transport Policy, special studies undertaken by the MoT, and discussion of transport system performance.

11.10 MoT should play a key role in transport data development

The MoT should have a key role in ensuring that Malawi's data meets its needs. They should work closely with the NSO, other agencies and the private sector to ensure that the data collected is appropriate, high quality and useful. Any data collected by MoT should be done in a simple, cost effective and sustainable manner.

11.11 Make use of NSO's ability to conduct special surveys

The TPU should make use of NSO's ability to conduct special transport surveys such as the one just completed on minibus operations or the proposed study of Malawian truck transporters' participation in international traffic. The TPU should make the NSO aware of any special transport data needs.

11.12 Become proactive in working cooperatively with other data organizations

The Ministry must become a leader in working cooperatively with data organizations to ensure that the data needed is collected in a quality manner.

Data Sources Appendix

1 National Statistical Organization
- C Monthly Statistical Bulletin
- C Malawi Statistical Yearbook
- C Transport Statistics
- C External Trade
- C Malawi Customs is the source of this data
  - Bill of Entry for the export of goods subject to drawback
  - Bill of Entry for clearance of goods for consumption import
  - Authority to Remove to another Customs station

2 National Economic Council
- C Economic Review

3 Reserve Bank of Malawi
- C Financial and Economic Review

4 Ministry of Transport
- C International Traffic Statistics
- C Aircraft Register
- C Traffic Handled at Lilongwe, Chileka, Mzuzu, Karonga
- C Number of Air Passengers by Origin and Destination
- C Aircraft Movement (Operations) Analysis by Airport
- C International Schedules by Airport

5 Malawi Lake Service
- C Lake Transport Performance

6 Air Malawi Annual Report
- C Financial and Operating Statistics

7 International Air Transport Association
- C Domestic Scheduled Passengers
- C International Scheduled Passengers
- C Domestic Cargo
- C International Cargo

8 Malawi Railways Limited
- C Compendium

9 Shire Bus Lines (formerly Stagecoach Malawi Limited)
- C Management Accounts

10 ADMARC
- C Annual Reports

11 Other Sources

- Periodic data has been collected from trucking companies (Malawi International Transport Co. Ltd [MITCO] April 1994) Breakbulk and Containerized cargo transported by Malawi truckers.

- National Statistics Office - Minibus survey to be completed May 1999